**太阳能电池输出特性测量数据记录**

组号： 01 ；姓名 莫卓儒

第一组：=45.1mA，=2.10V

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 次数 | U(V) | I(mA) | R(Ω) | P(mW) |
| 1 | 0.01 | 44.9 | 0.22 | 0.45 |
| 2 | 0.46 | 44.9 | 10.24 | 20.65 |
| 3 | 0.9 | 44.9 | 20.04 | 40.41 |
| 4 | 1.35 | 44.9 | 30.7 | 60.61 |
| 5 | 1.7 | 42.5 | 39.63 | 72.25 |
| 6 | 1.8 | 36.1 | 49.86 | 64.98 |
| 7 | 1.85 | 30.9 | 59.87 | 57.17 |
| 8 | 1.88 | 29.9 | 62.88 | 56.21 |
| 9 | 1.9 | 23.8 | 79.83 | 45.22 |
| 10 | 1.91 | 21.4 | 89.72 | 41.09 |
| 11 | 1.93 | 19.4 | 19.48 | 37.44 |
| 12 | 1.95 | 16.3 | 119.63 | 0.03 |
| 13 | 1.96 | 15.1 | 129.8 | 0.03 |
| 14 | 1.97 | 14.1 | 139.72 | 0.03 |
| 15 | 1.97 | 13.2 | 149.24 | 0.03 |
| 16 | 1.97 | 12.4 | 159.68 | 0.02 |
| 17 | 1.98 | 11.7 | 169.23 | 0.02 |

表1 短路电流=45.1mA时测得的电流和电压值

第二组：=35mA，=2.03V

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 次数 | U(V) | I(mA) | R(Ω) | P(mW) |
| 1 | 0.01 | 35 | 0.29 | 0.35 |
| 2 | 0.35 | 35 | 10 | 12.25 |
| 3 | 0.7 | 35 | 20 | 24.5 |
| 4 | 1.39 | 33.5 | 39.71 | 48.65 |
| 5 | 1.66 | 33.5 | 49.55 | 55.61 |
| 6 | 1.75 | 29.5 | 59.32 | 51.63 |
| 7 | 1.79 | 26 | 68.84 | 46.54 |
| 8 | 1.82 | 23.1 | 78.79 | 42.04 |
| 9 | 1.82 | 20.8 | 87.5 | 37.86 |
| 10 | 1.86 | 18.9 | 98.41 | 35.15 |
| 11 | 1.88 | 17.3 | 106.82 | 35.52 |
| 12 | 1.89 | 16 | 118.12 | 30.24 |
| 13 | 1.9 | 14 | 135.71 | 26.6 |
| 14 | 1.91 | 13.8 | 138.41 | 26.36 |
| 15 | 1.92 | 11.5 | 166.96 | 22.8 |

表2 短路电流=35.0mA时测得的电流和电压值

第三组：=25mA，=1.97V

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 次数 | U(V) | I(mA) | R(Ω) | P(mW) |
| 1 | 0.01 | 25 | 0.4 | 0.25 |
| 2 | 0.25 | 24.9 | 10.04 | 6.23 |
| 3 | 0.5 | 24.9 | 20.08 | 12.45 |
| 4 | 0.74 | 24.9 | 29.72 | 18.43 |
| 5 | 1 | 24.9 | 43.4 | 30.63 |
| 6 | 1.47 | 24.9 | 59.04 | 36.6 |
| 7 | 1.64 | 23.8 | 68.91 | 39.02 |
| 8 | 1.71 | 21.7 | 78.8 | 37.11 |
| 9 | 1.75 | 19.7 | 88.83 | 34.48 |
| 10 | 1.78 | 18 | 98.89 | 32.04 |
| 11 | 1.8 | 16.6 | 108.43 | 29.88 |
| 12 | 1.81 | 15.3 | 118.3 | 27.69 |
| 13 | 1.83 | 14.3 | 128 | 26.17 |
| 14 | 1.84 | 13.3 | 138.34 | 24.45 |
| 15 | 1.85 | 12.5 | 148 | 23.13 |
| 16 | 1.85 | 11.8 | 156.78 | 21.83 |
| 17 | 1.85 | 11.1 | 167.57 | 20.64 |
| 18 | 1.86 | 10.5 | 178.09 | 19.64 |
| 19 | 1.87 | 10 | 187 | 18.7 |

表3 短路电流=25.0mA时测得的电流和电压值

第四组：=15mA，=1.90V

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 测量次数 | U(V) | I(mA) | R(Ω) | P(mW) |
| 1 | 0 | 15.1 | 0 | 0 |
| 2 | 0.15 | 15.1 | 10 | 2.25 |
| 3 | 0.3 | 15 | 20 | 4.5 |
| 4 | 0.45 | 15 | 30 | 6.75 |
| 5 | 0.6 | 15 | 40 | 9 |
| 6 | 0.74 | 15 | 49.33 | 11.1 |
| 7 | 0.89 | 15 | 59.33 | 13.35 |
| 8 | 1.04 | 15 | 67.1 | 15.6 |
| 9 | 1.19 | 15 | 79.33 | 17.85 |
| 10 | 1.33 | 15 | 88.67 | 19.95 |
| 11 | 1.48 | 15 | 98.67 | 22.2 |
| 12 | 1.59 | 14.6 | 108.9 | 23.21 |
| 13 | 1.65 | 13.9 | 118.7 | 22.94 |
| 14 | 1.68 | 13.1 | 128.24 | 22.01 |
| 15 | 1.7 | 12.4 | 137.1 | 21.08 |
| 16 | 1.72 | 11.7 | 147.01 | 20.12 |
| 17 | 1.74 | 11 | 158.19 | 19.14 |
| 18 | 1.75 | 1.04 | 168.27 | 18.2 |
| 19 | 1.76 | 1.99 | 177.78 | 17.74 |

表4 短路电流=15.1mA时测得的电流和电压值

**表5 电阻及由得到的内阻的比较**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **测量值/组数** | **第一组** | **第二组** | **第三组** | **第四组** |
|  | 39.63 | 49.55 | 68.91 | 108.90 |
|  | 45.56 | 58.00 | 78.80 | 126.67 |
|  | 0.87 | 0.85 | 0.87 | 0.86 |

**表6 最大输出功率与填充因数**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **测量值/组数** | **第一组** | **第二组** | **第三组** | **第四组** |
|  | 72.25 | 55.61 | 39.02 | 23.21 |
|  | 92.25 | 71.05 | 49.25 | 28.5 |
| F | 0.78 | 0.78 | 0.79 | 0.81 |